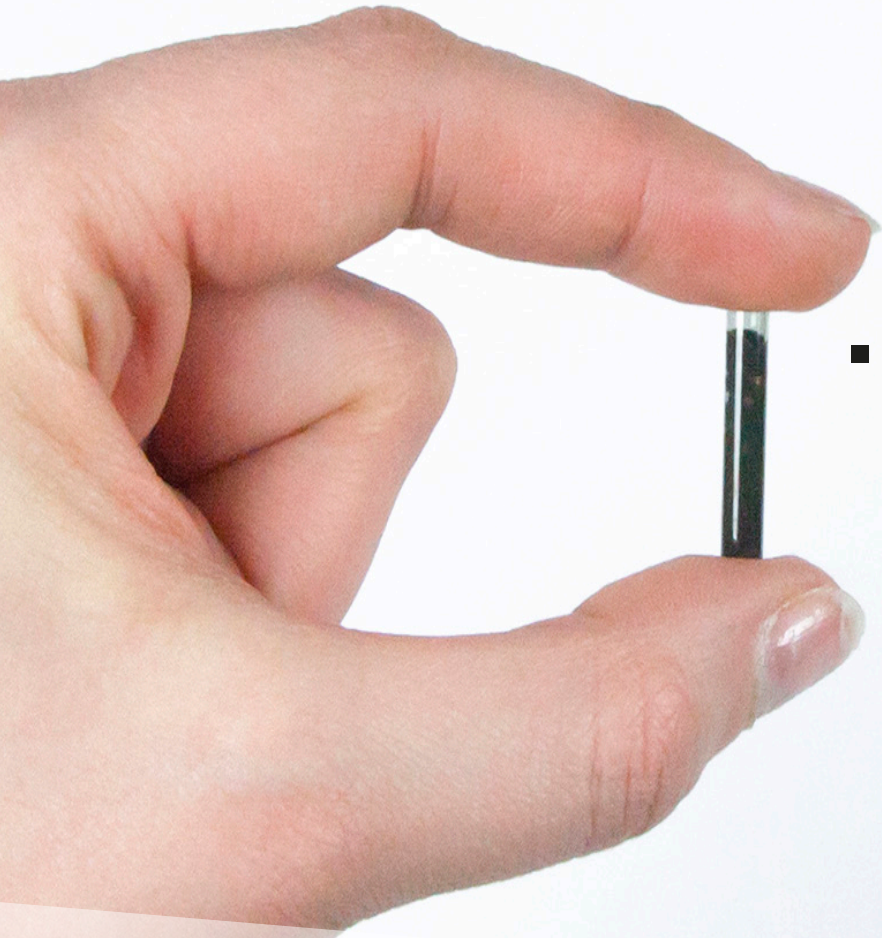
CARS, KEYS & LOCKS

The Knowledgebase for Todays Locksmith



Tackling VAG Locks

KEYLINE MICRO SERIES

Let's do the Tango!

NNAL
National Network of Approved Locksmiths

The FREE Technical Magazine

Issue 2 April 2016

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Bio's of this Months Contributors



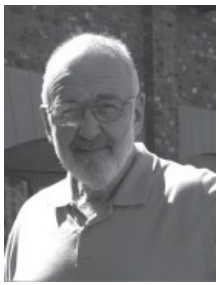
Martin Pink

The highly respected locksmith Martin Pink has been at the forefront of the development of both tools and techniques for picking and decoding many of today's toughest locks. Martin has been instrumental in the progression of the Genuine Lishi brand and was the writer of their definitive lock opening guide – The Genuine Lishi Training Kit. Martin is known for his knowledge of car lock technology, and is highly sought after at locksmith exhibitions and training events around the world.



Massimo Bianchi

Massimo Bianchi is the Keyline Strategic Planner and he works tirelessly to advance the reputation of the Keyline brand worldwide. Massimo is highly respected throughout the industry for his passion for locks and his in depth knowledge of keys, key cloning and cutting machines. This knowledge and passion is built on nearly 350 years of the Bianchi family being at the centre of key development and advancement, and they have pioneered many developments in the world of key cutting and car key related technology.



Chris Belcher

Everyone in the locksmith world knows and respects Chris Belcher and his huge knowledge and understanding of locks and how to defeat them. Chris's development of the RPCP tools to overcome British Standard Mortice Locks revolutionised the industry, and his genius is seen in the Multi Gauge Mortice Pick – the production of which bamboozled even the best engineers in the UK. Of course to Chris this is just business as usual and comes from his skill as a Submarine Engineer in the Royal Navy for over 30 years, as Chris says, "You can't nip to B&Q if something goes wrong when you are 1000 feet below the surface."



Richard Bunn

Having previously worked as an IT professional Richard went on to train with SAVTA (Safe and Vault Technicians) in the USA. On his return to the UK he went in search for as many locksmiths, safe and automotive training courses he possibly could to refine his skills further.

Fifteen years of successful locksmithing later, Richard has specialised as an automotive locksmith and completes over 1000 'lost keys' jobs per year for customers such as the RAC.

Letter from the Editor

In the second edition of Cars, Keys & Locks – the comprehensive guide from Tradelocks, we will be sharing with you the second part of our VAG locks guide. In the last edition we gave insight into tackling VAG locks, generations 1, 2 and 3. On pages 4-14 you'll find more material relating to the new 2015 VAG locks, with even more picture how to guides and more detailed explanations on picking and Identifying the locks.

We will be giving you full details of the new ABS Opening Tool (not manufactured by ABS) distributed by Tradelocks, and full instructions on using this simple and effective tool. Not to mention the first part of our extensive guide to using the latest technology in transponder reading, creating and cloning – Tango.

The latest innovation from Keyline, the glass transponder chip, is explained in full by Mr Bianchi himself on pages 32-33, from how they are made, to how they work and what their cloning capability is.

Martin Pink has more answers to your auto locksmith questions in the 'Ask the Expert' section, and he has given the first in his explanatory guide to site reading VAG Keys. And to tie everything off, Chris belcher gives further insight into lock bumping with the basic guide to recognising a bumped cylinder on pages 34-37.

If you missed out on edition 1 of CKL, you can now find the full magazine archive on our newly launched website www.locksmithmag.com. Here you can see the full edition of the magazine and can message your questions in for locksmith professional Martin Pink. And if you haven't already, don't forget to subscribe – so you never miss an issue again! The subscription page can be found at the back of this edition. I hope you enjoy issue 2 of Cars, Keys & Locks.

A note from the Sponsors:

At last, a magazine written by practising industry experts for the benefit of the industry! No waffle, no news, no self-praising, back slapping articles only of interest to the person who wrote them. Instead just solid technical articles - aimed to help the reader understand a particular issue. This is exactly what the industry has wanted for a long time! It is a tribute to the industry giants who have worked tirelessly to master their subject.

We hope you find Cars, Keys and Locks useful, and we hope that it becomes the reference library we aimed it to be and an essential part of your day to day work!

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Tackling VAG Locks › Part II

By Martin Pink

The VAG HU162 (8 Cut Lock)

Lock Profile

This is the first of the 3 locks released by VAG at the end of 2014.

Picking this lock is straight forward; but the use of inverted wafers and the lack of available key rules and series information, has meant it's not yet been possible to produce a definitive and accurate decode grid. So, for the time being, only the picking details have been released.

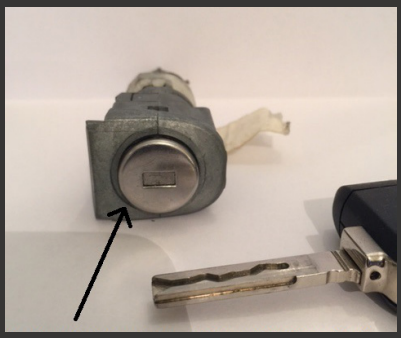
In the UK, this 8 cut lock has been seen on the following models:

VW Golf from late 2014
VW Polo from late 2014
Seat Ibiza from late 2014
Seat Leon from late 2014

With the list growing.

The lock can be identified visually (refer to issue 1 for more information on lock ID) as shown below:

VAG 2015, 8 CUT



Horizontal keyway with a slightly raised facecap that overhangs from the lock body by approximately 3/4mm

It can easily be differentiated from the older, larger HU66 keyway, as the HU162 is horizontal. The protruding cap instantly distinguishes it from the new 9 cut keyway – making it easy to visually Identify.

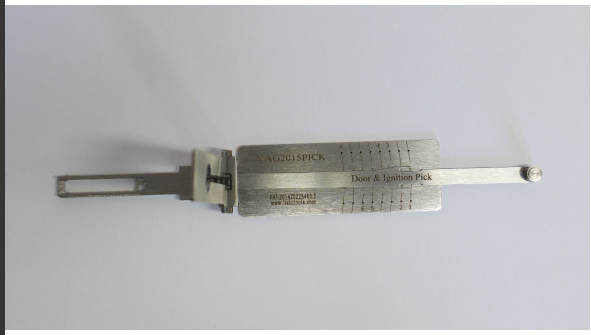
This lock has 8 conventional wafers in the 2 up, 2 down format, and picks to the same picking sequence as the older HU66. Picking positions 1, 5, 8 and 4 first in their binding order and then picking of positions 2, 6, 7 and 3 in their binding order to open.

TIP: Don't be surprised if a few positions drop out and need re-picking.

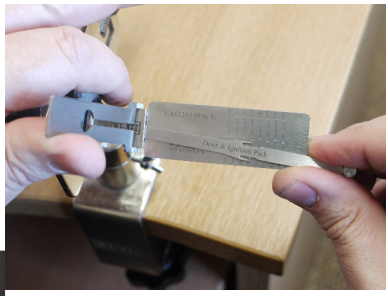
Picking Instructions

How to open the VAG 2015, HU162 8 cut lock, using the Genuine Lishi 8 cut pick:

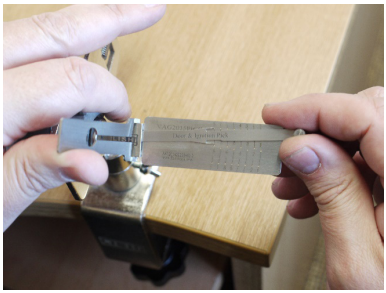
Below is the VAG 8 cut pick; it's a conventional, single lifter, 2 track, Genuine Lishi tool.



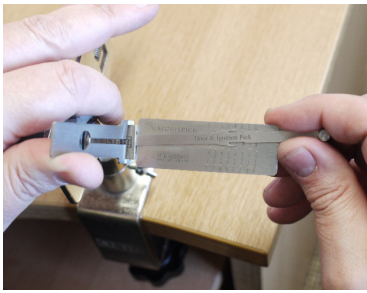
Firstly, insert the tool into the lock and check positions 1, 5, 8 and 4 to find their binding order.



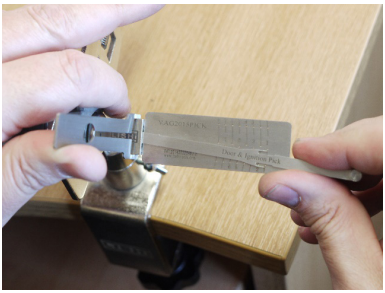
Position 5 is the lst to bind and pick



Position 8 is the next to bind and pick

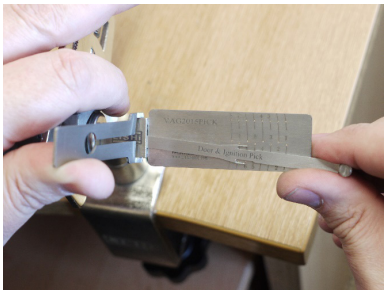


Position 4: bind and pick



Position l: bind and pick

At this point positions 1, 5, 8 and 4 are all slapping nicely and feel set, so now move on to positions 2, 6, 7 and 3 in their binding order.



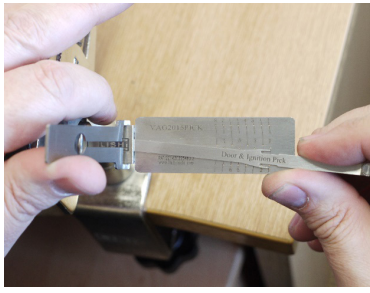
Position 6: bind and pick



Position 7: bind and pick



Position 3: bind and pick



Position l was binding again, so picked



After position 1 dropped out it was bound again and once picked, the lock is open. The 8 cut lock is straight forward to open; the tool is precise and feedback on it is excellent. You pick each binding wafer in turn; all the wafers that need picking will bind as normal – so it is no different than picking the older HU66 lock.

The only position that didn't need picking was position 2, which indicates that position 2 is the lowest cut and is pre-set by the tool.

The lock uses 4 inverted wafers, but due to the absence of any released series, key rules or biting details, we have held back from releasing the decode at this time.

The VAG HU162 (9 Cut Lock)

Lock Profile:

This is where VAG has upped their game; releasing the 9 cut lock with 6 conventional cuts in positions 4 to 9, but with the introduction of 3 side mounted cuts that need to be picked sideways in positions 1 to 3.

The ways the cuts are positioned are:

Positions 1 and 2 are sideways mounted wafers located on the top profile

Position 3 is a sideways mounted wafer located on the bottom profile

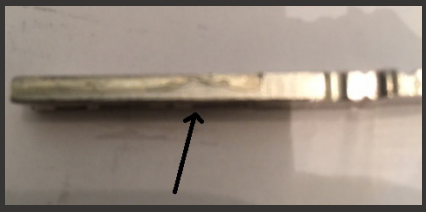
Positions 4 to 9 are conventional cuts in the 2 up, 2 down format

This lock has 4 key heights on the conventional cuts and 3 key heights on the side cuts. It uses the same key blade as the 8 cut lock, with the main difference being it has the 3 side cuts on the top and bottom profiles - but it is the same section and blade as the 8 cut lock.

Look at the key blade below:



VAG 9 cut key: you can see the thick part of the profile is the same as the 8 cut keyblade. The noticeable difference being the side profile key cuts that cut onto it, to interact with the side mounted wafers within the first 3 positions of the lock.



SIDE WAFER CUTS

Despite having the 3 side cuts on the key profile, the key still holds the full 9 conventional cuts on the key blade. The reason for this is the side cuts are only found in the door lock on non-keyless models with an ignition lock. The ignition lock uses a straight 9 cuts with no side cuts. In the door lock, the mechanical key can only enter the lock the correct way up, due to the side cuts being 2 on the top profile and 1 on the bottom profile - but the ignition, using just 9 conventional cuts can be entered either way up.

To identify the lock:

Horizontal keyway with the same profile as the 8 cut but with 3 side cut wafers – 2 cuts on I profile and I cut on the opposite profile.

Note: the raised lip on the lock body around the plug and facecap sits flush to the raised lip.



VAG 9 CUT LOCK

On the 9 cut lock, the face cap does not protrude as it did with the 8 cut, and it has a raised lip surrounding the plug, which the plug sits flush to.

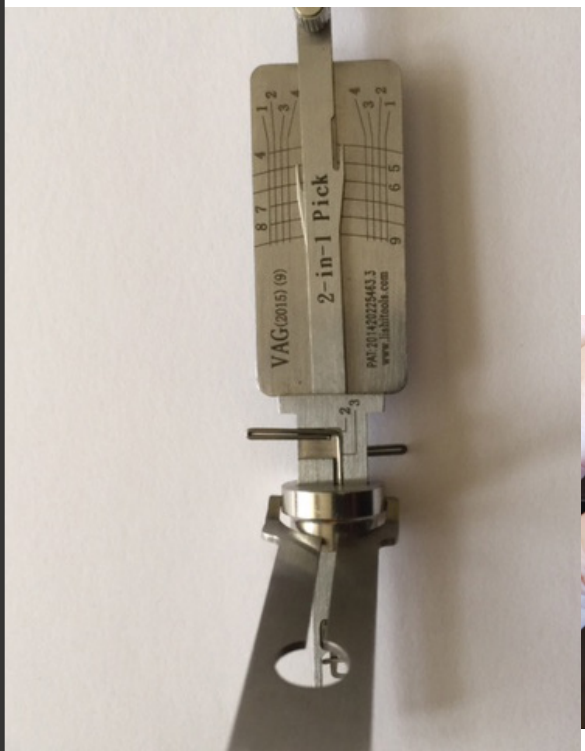
To date, this lock has only been seen on one model of vehicle in the UK, the VW Golf Plus from 2015, but has been seen extensively in Europe on the VW polo models and VW golf models as well.

The decode for this lock is the same as with 10 cut lock (see details for decoding the 10 cut lock later in the guide).

Picking Instructions

How to pick the VAG 2015 HU162, 9 cut lock, with the Genuine Lishi Pick and Decoder:

Below is the Genuine Lishi 9 cut tool. The twin lifters are for the conventional cuts in positions 4 to 9, the side cut pick arm on the front top of the tool is for the first 2 side cuts. The side cut pick arm on the back bottom of the tool is for the remaining side cuts on the opposite side profile.



The picking process for this lock defies the traditional process that you encounter with most Lishi tools and a totally different process must be adopted.

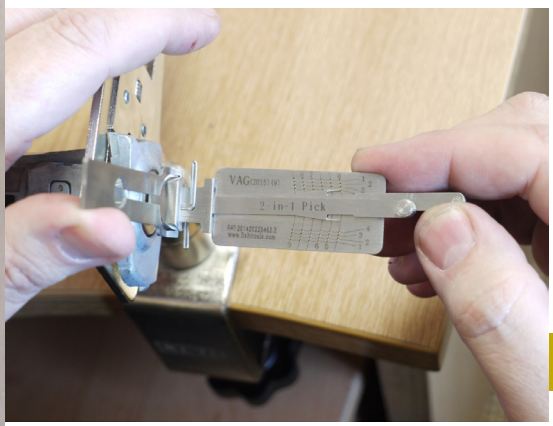
Its difference to the 8 cut lock is apparent when feeling for binding wafers. You will be lucky to find the odd binding wafer, as more often than not, there will not be any.

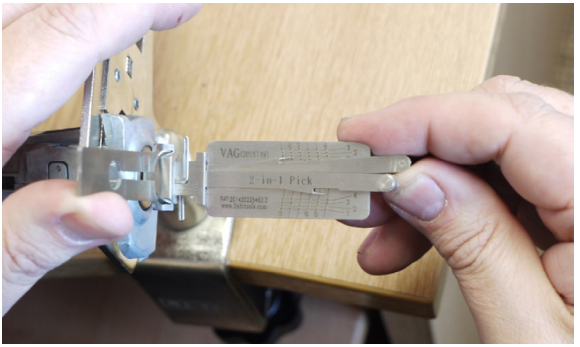
Traditionally when picking with a Lishi tool you would use the rule: 'If the wafer moves then leave it alone and only ever pick a solid binding wafer.'

For this lock you must disregard this rule and approach it in a totally different way, following an alternative process.

For example: If a wafer gives a tight slapping feel, it's assumed it was set and doesn't need picking at all. With the 9 cut lock, totally disregard this and instead follow the 9 cut lock picking procedure.

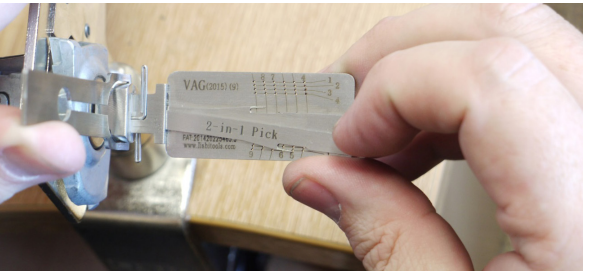
So, pick the lock as follows:

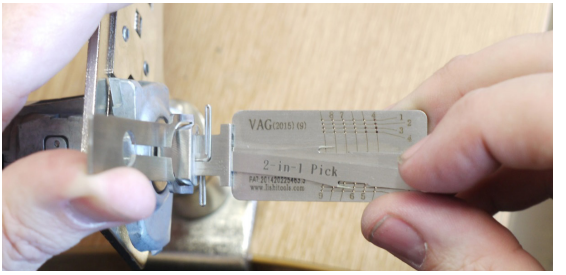


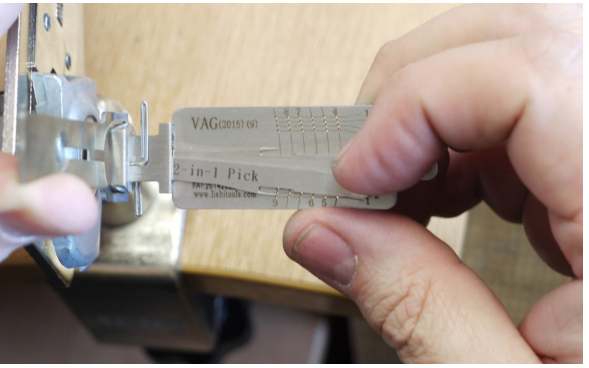


Push position 4 past its first stop position and it will skip to its set position - position 7 resisted heavily so it doesn't need picking past its first stop position, so leave this one alone - push position 8 past its first stop position to its set position.

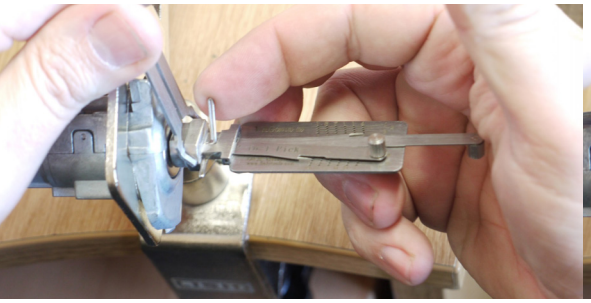
Push position 5 past its first stop point where it skips to its set position, and then push position 6 past its first stop point where it skips to its set position.

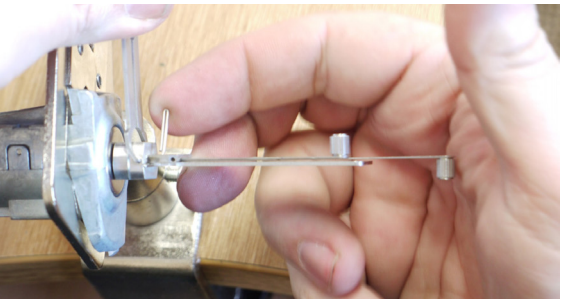






Then push position 9 past its first stop position where it skips to its set position. At this point all of the conventional cuts are set and slapping tightly in their set positions. You can now move on to the picking of the side cuts, the side cuts follow a more conventional picking process. These will be solid if they want to be picked - they will have a slight bounce if they don't need to be picked.





On position 1 the first side cut is binding, so gently pick it to its next position. As soon as it's picked the lock fully opens, which means the other 2 side cuts are the lowest cut and don't need picking. Once the different picking process is mastered, this lock is quick to open, but following the different procedure is essential to achieve a hassle free opening.

The decode is the same as the 10 cut lock, so you can read how to decode a 9 cut lock in the next section.

The VAG HU162 (10 Cut Lock)

Lock Profile:

The last of the new locks released by VAG is the 10 cut lock; and despite using the same HU162 blade it differs greatly to the previous 2 new locks. The 10 cut uses a reverse section, so the profile is the opposite way around to the 8 and 9 cut locks, as shown in the below image:

9 CUT

Left profile





10 CUT

Right profile

We can easily see the profile differences between the 9 cut key and the 10 cut key, and why the keys and tools will not fit into each other.

There are 10 cuts in total; the first 4 are sideways mounted wafers reading off the keys profile. The back 6 cuts are conventional cuts and the cuts are positioned in the lock as follows:

Positions 1 and 2 are side cuts picked off the top profile

Positions 3 and 4 are side cuts in opposite direction picked off the bottom profile

Positions 5 to 10 are conventional cuts This lock uses inverted wafers, which will be covered at the end of the decode part of the guide.

Here is how to identify this lock:

THIS LOCK VERSION HAS 4 SIDE CUTS, 2 ON THE TOP PROFILE AND 2 ON THE BOTTOM PROFILE



FOR ID PUPRPOSES, NOTE:

No lock body lip as with the 9 cut, the face cap protrudes from the lock body by 1.25mm so it is more profound then the 8 cut and also has a horizontal keyway.

The 10 cut lock has no raised lip like the 9 cut; instead it has an inverted lip surrounding the keyway, the face cap is not flush and protrudes slightly - but not as profoundly as the 8 cut plug.

As well as having 4 side cuts in positions 1 to 4, the key also has conventional cuts in positions 1 to 4; this is in anticipation of eventual models fitted with ignitions (ignitions cannot house side cuts, so both are found on the key).

The coverage of the 10 cut tool is still a working progress, but so far the following have been confirmed in the UK:

Audi TT 2015 on
Audi A4 2015 on
Audi Q3 2015 on
Audi Q5 2015 on
Audi Q7 2015 on
VW Passat 2015 on
VW Passat CC 2015 on

The absence of any key series, key rules and definitive coverage makes it difficult to update coverage lists and all information has been attained through locksmith feedback and personal findings.

Picking Instructions

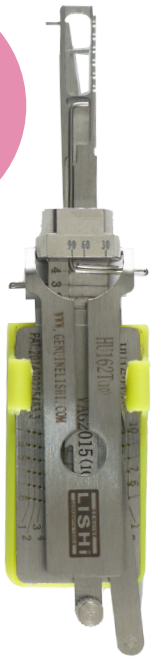
How to pick the HU162, 10 cut lock using the Genuine Lishi VAG 2015 10 cut pick and decoder:

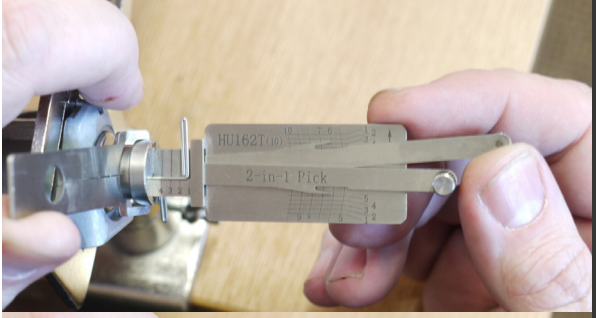
The 6 conventional cuts are picked by the tools twin lifters; 3 cuts on the top row and 3 cuts on the bottom row. The 4 side cuts in positions 1 to 4 are picked by the 2 side cut lifters, 2 on the top row and 2 on the bottom. In all test locks to date, positions 1 and 2 pick on the front top lifter and positions 3 and 4 pick on the back bottom lifter. The tool has been designed so that each side cut lifter can pick any of the 4 positions - in case VAG decide change the format of locks.

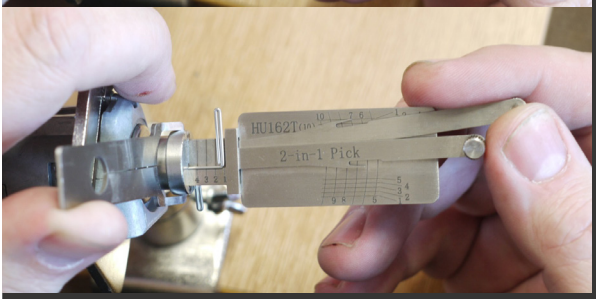
The picking process for this lock is the same as picking the 9 cut lock, we begin with the 6 conventional cuts, once all set correctly we pick the side cuts and the lock will open.

This lock picks following the same process as the 9 cut lock (see 9 cut lock picking procedure on page 7 for instruction)

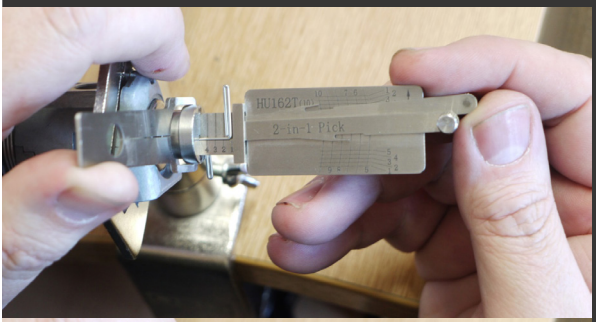
VAG 2015/ HU162

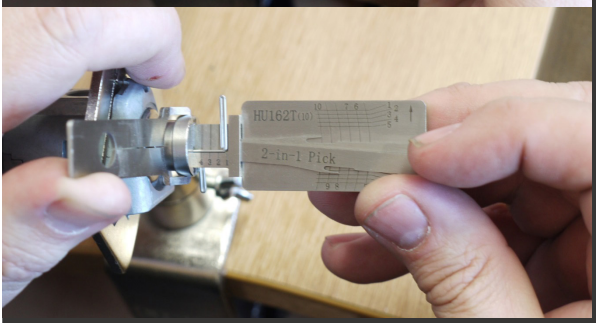






Position 6 moved to its first position then skipped past to its set position. Position 7 moved to its first position, then with a little more pressure, skipped to its set position.

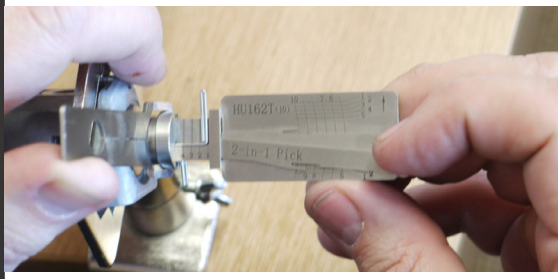


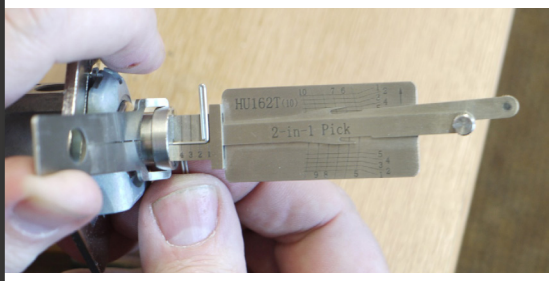


Position 10 moved to its first position then skipped to its set position, (position 5 moved to its first position but resisted moving past this so it needs to be left alone). Position 8 moved to its first position then skipped past this to its set position.

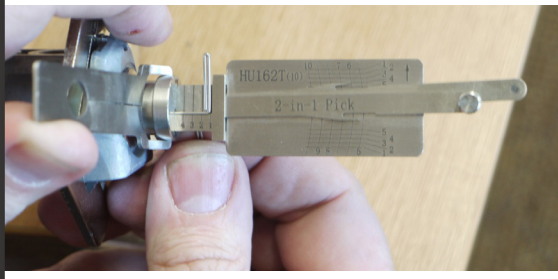
Position 9 pushes to its first position then skips to its set position with a little more pressure - all conventional cuts are now set so we proceed to pick the side cuts open.

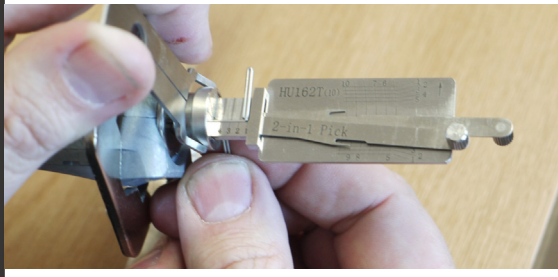
Like with the 9 cut lock, the side cuts pick following a traditional picking procedure - if binding we pick it, if there is spring movement, we leave it alone.





Position 4 was the first side cut to bind, so pick it until it feels springy – position 3 was the next side cut to bind so I pick it until it is slapping on the spring.

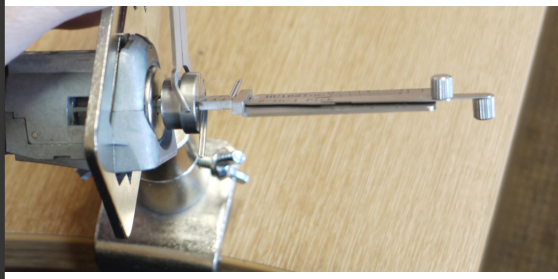




The position 4 side cut is the only one binding again; so it needs to be picked again. As soon as position 4 was picked again the lock opened fully.

Neither position 1 or 2 needed picking, which suggests these were the lowest side cuts already set by the tool.

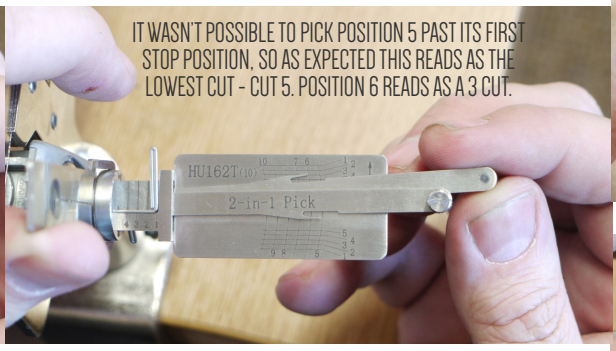
Now the lock is in the open position, we can proceed to decode it.

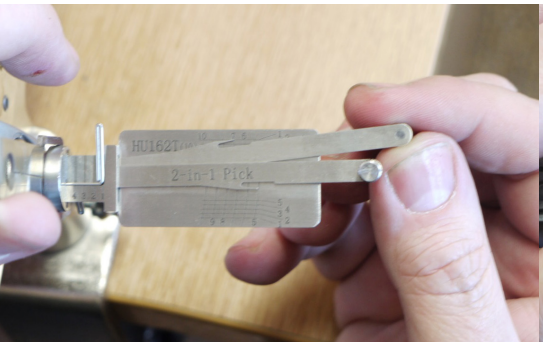


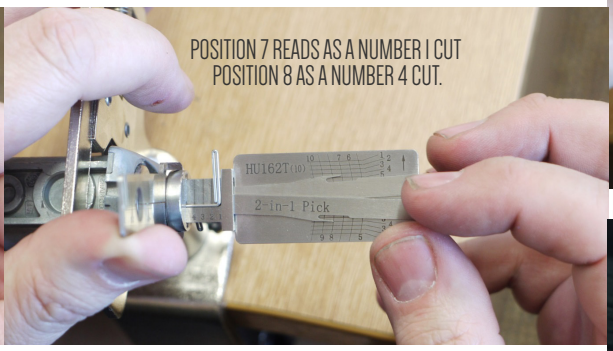
Decoding Instructions

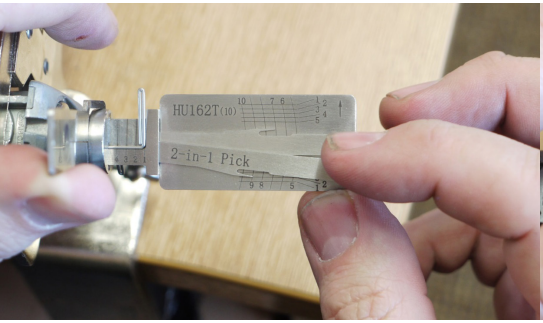
Decoding of the HU162, 10 cut lock (same procedure for 9 cut lock):

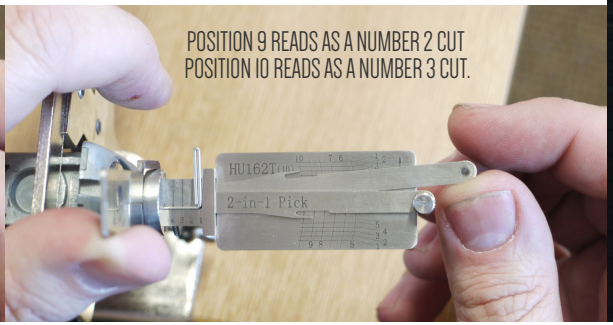












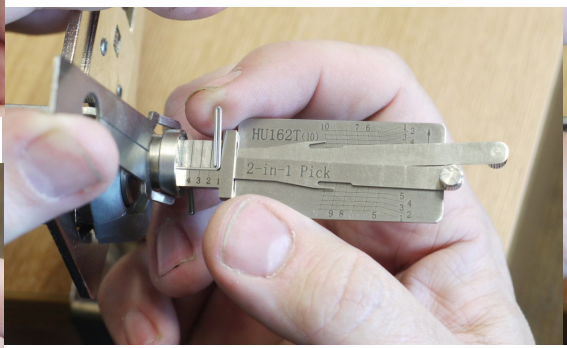
So the decode of the conventional key cuts gives us a reading in positions 5 to 10 of: 531423

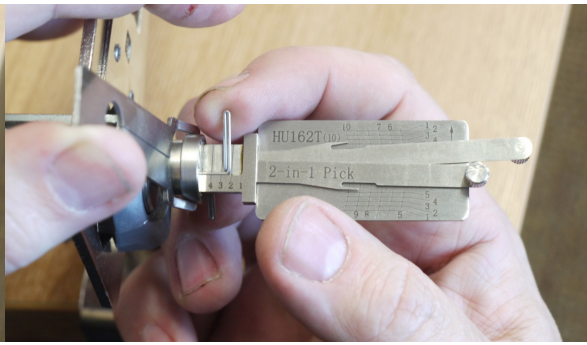
To decode the side cuts, we must use a grid that's probably unfamiliar to most; we use the grid on the round, pick wire stabiliser:



You will notice that this stabiliser has 3 markings on it, the first one is cut 1, the second is cut 2 and the third is cut 3. Where it stops is the side profile cut. So you clearly see that this image is of position 4 reading a 2 cut.

Position 1 moves to the first side cut mark so is a cut - position 2 moves to the first side cut mark so is a 3 cut.









We use the grid on the round, pick wire stabiliser

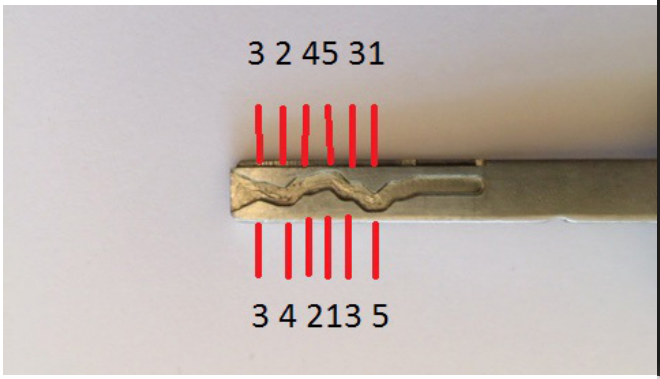
Position 3 decodes on the furthest mark, so it is a 1 cut - position 4 decodes on the second mark, so it is a number 2 cut. This gives us a decode on the side cuts of: 3312.

So our full key will be decoded as below:

Position	Cut
1 side	3
2 side	3
3 side	1
4 side	2
5 normal	5
6 normal	3
7 normal	1
8 normal	4
9 normal	2
10 normal	3

A full key of: 3312531423

When looking at the key with the tip to the left, the tool reads it as follows:



Positions 5, 8 and 9 on the top track
Positions 6, 7 and 10 on the bottom track

This is the key for the test lock with the readings on both tracks marked on it.

The decode with the tool was from position 5 to 10: 531423. This particular lock has 1 inverted wafer. This is known because of the position 5 cut of a 5, which should have read on the top track; instead the 5 reading was right but on the bottom track. What is not yet evident is how we would enter this in the machine to cut - should we enter as a 5 or as a 1, inverted? This will become clear once the series is revealed.

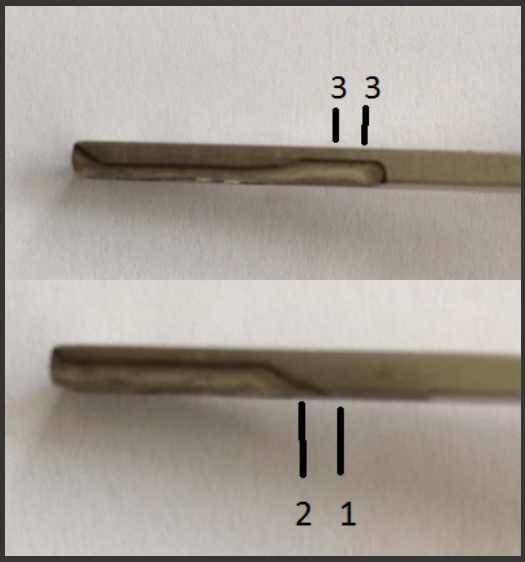
You can see from the picture of the key that the tool has read all other positions correctly as below:

Position 5 read on the bottom track as a 5 cut, so it is inverted as it should have read on the top track.

Position 6 on the bottom track as a 3 cut
Position 7 on the bottom track as a 1 cut
Position 8 on the top track as a 4 cut
Position 9 on the top track as a 2 cut
Position 10 on the bottom track as a 3 cut

So once we can determine the inverted positions by scope, we can see that the tool has read the correct key of: 531423 in the conventional cuts.

Look at the side cuts on the key below:



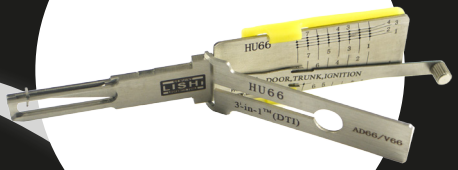
Positions 5, 8 and 9 on the top track
Positions 6, 7 and 10 on the bottom track

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NVLISHI3-1HU66 (GEN3)



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Q1

My cut to code machine won't decode a VA2/VA6 key using the 1234Q5678H series found on Clio 3, Toyota Aygo, Citroen C1, Peugeot 107 and the later phase 3 Renault key card bypass keys. I'm struggling to site read these and enter the correct key cuts to cut the correct key. Have you any info on doing this and site reading this series?

A

This has a complex arrangement due to the use of inverted wafers in the lock.

Many try and figure out, when looking at a key whether they need a 5, 6, 7, 8 cut entered or a 1, 2, 3 or 4 cut entered. Many find it hard to understand the numbering and the introduction of the values H&Q in the series.

Accurate key reading of both the Clio 3 double sided key and the Renault phase 3 single sided key have now been added to the Ninja range of machines.

Here is how to read and copy them using other machines. Take a typical double sided Clio 3 key using this system below.

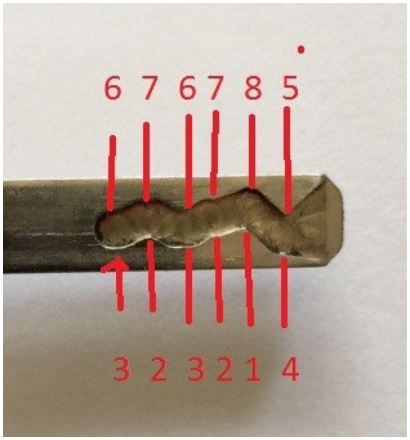
THE USE OF THE VALUES H & Q

These values have little significance, H is exactly the same cut as an 8 cut and Q is exactly the same as a 4 cut. The values H & Q are only used if you have consecutive 4 cuts or 8 cuts sat next to each other, i.e., 44, 48, 84 or 88.

For example if the OEM manufacturer code is QH7376 and we have to enter the direct cuts, we must reverse the code. We would enter 6737HQ and cut the correct key from bow to tip.The Q&H readings can be changed to cuts - Q will be a 4 and H will be an 8. So if you are inputted the following code instead of 673784, you would cut the exact same key - which should simplify the Q and H readings for you.

READING THE KEY

Below is a picture of a key with its true value in each position:



THE TOP AXIS IS THE H8765 NUMBERED AXIS WHERE:
8 & H = 1.15MM
7 = 1.97MM
6 = 2.65
5 = 3.35

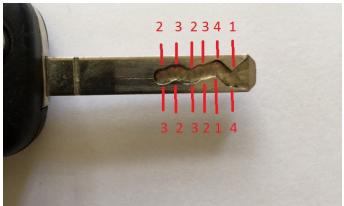
NUMBERED AXIS WHERE:
4 & Q = 1.15MM
3 = 1.97MM
2 = 2.65MM
1 = 3.35MM

The key is with bow to left and tip to right; this image shows the measurements as well as the values in each position of this key. From this you can see that our code of 673784 means the key is reading positions 124 and 5 on the top row, and positions 3 and 6 on the bottom track.

The cuts on the top track have the same heights as those on the bottom. It is just the number values that differ in the series; the top track uses values 6 to 8 and the bottom track uses values 1 to 4. Basically the following:

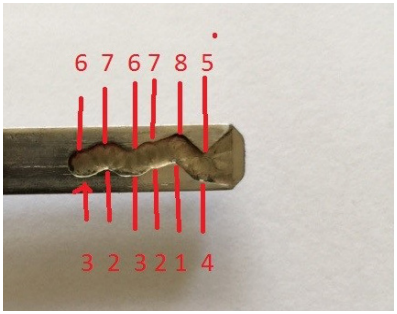
A number 1 cut on bottom track is same height as a 5 cut on top track
A number 2 cut on bottom track is same height as a 6 cut on the top track
A number 3 cut on bottom track is same height as a 7 cut on the top track
A number 4 cut on bottom track is same height as an 8 cut on top track

The values are just different depending which track they sit on. Every cut will have its opposite cut sitting opposite; to show this in simpler terms I've changed top track values to 1234 to show this in the below photo.

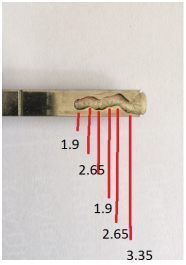


So the following in real life will always be true:

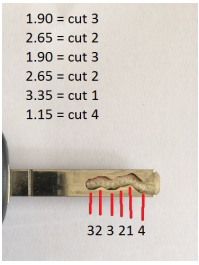
A number 1 cut on bottom track will always have a number 8 cut opposite it on top track
A number 2 cut on bottom track will always have a number 7 cut opposite it on top track
A number 3 cut on bottom track will always have a number 6 cut opposite it on top track
A number 4 cut on bottom track will always have a number 5 cut opposite it on top track



The cut to code machines that list this series know what any values entered as a direct cut refer to. They also know that the opposite track has the correct value opposite it. So, we can simplify the reading we take and let the machine do the work for us. To do this we only need to read the bottom track of the key, with the key tip to right and bow to left. We just use the values 1 to 4 found on this track.



Converted to cuts:



Reading the bottom track we get a reading of 323214. If we enter 323214 into our cut to code machine; because they are all values of 1 to 4 the machine knows that it must cut the opposite cuts of 676785 to the top track and will do so automatically.

The correct key is read and cut every time following a much simpler process.



Let's do the Tango!

by Richard Bunn

From Beginner to Advanced
How to use the Tango Transponder Programmer Part I

Tango is the latest device that allows a user to read, write and manipulate a wide range of transponders. This cutting edge technology offers a huge and FREE library of Eeprom 'key maker' functions to be used by the more advanced user, and this range can even be extended further with a low cost upgrade for whichever vehicle you are working on.

(KEY MAKER: This is a function in Tango that takes the data that has been extracted from an immobiliser and uses it to create a working transponder key for that vehicle – it is an alternative to diagnostic programming, and in some cases the only other option.)

Here are some of the functions of Tango; from the basics to more advanced operations:

Installation:

Tango software comes loaded onto a memory stick. The product runs from a USB lead which plugs into your laptop/PC.



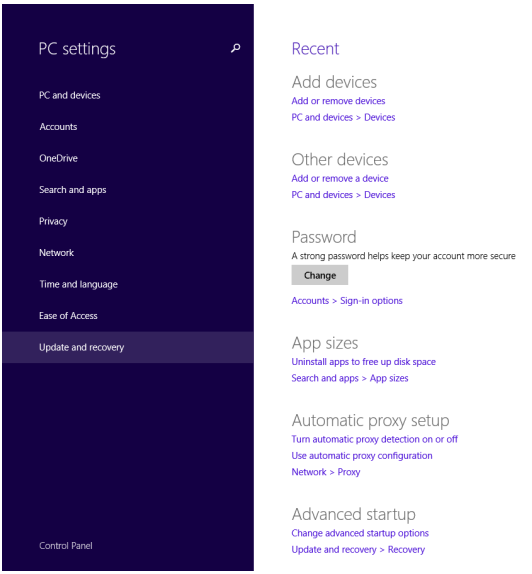
Step 1)
Load (copy & paste) all the files from the Tango USB stick onto your laptop/PC.

Step 2)
Before you continue any further with the installation you must switch off the 'driver enforcement' function on your operating system (this applies to systems such as Windows 8 or any other software whereby the drivers are not signed in). To do this go to 'settings' and complete the following instructions:

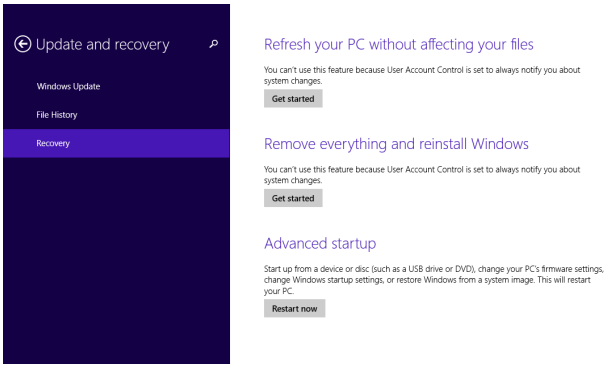
2a)
Press and hold the 'windows' key (shown below) on your keyboard and press the 'C' key to open the charm menu.
Click the gear icon labelled 'settings.'

2b)
Select 'change PC settings.'

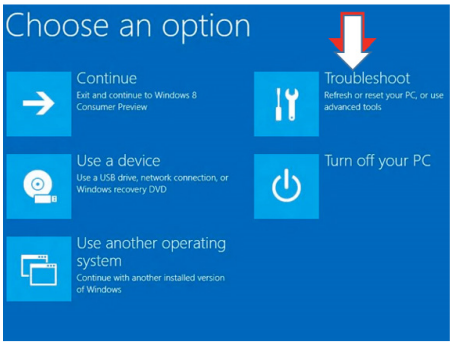
2c)
Select 'update and recovery.'



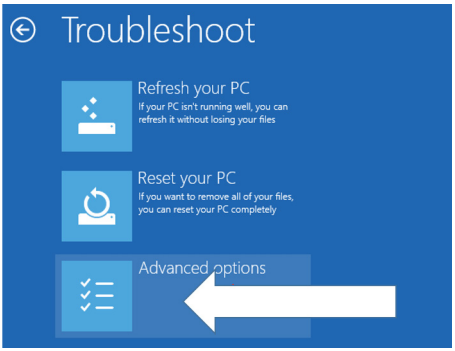
2d)
Under the ‘recovery’ option click ‘restart now,’ which you will see under ‘advanced startup.’



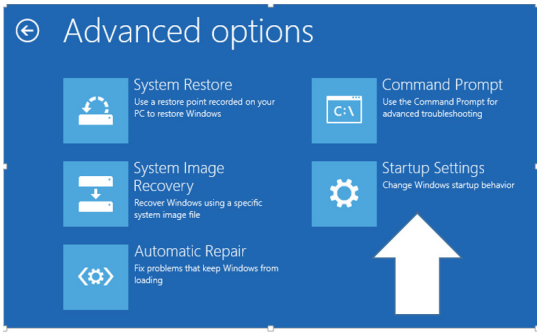
2e)
After the restart, choose the ‘troubleshoot’ icon.



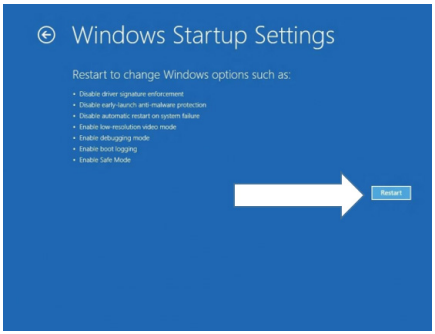
2f)
Select ‘advanced options.’

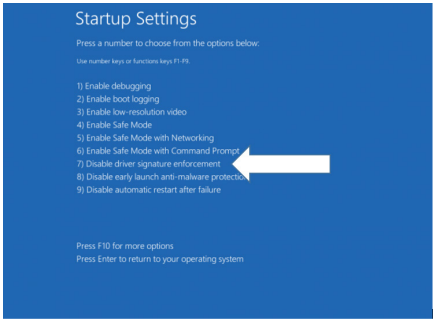


2g)
Under advanced options select ‘startup settings.’



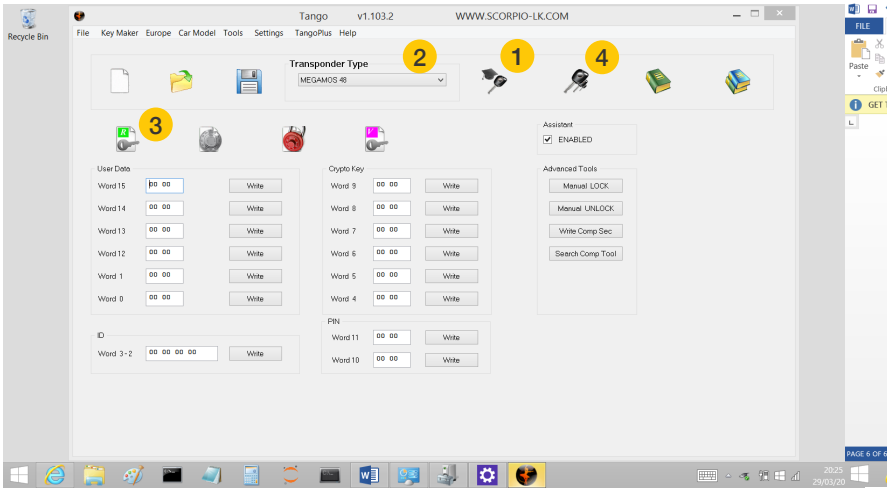
2h)
For the final time press the ‘restart’ button.





2i)
Finally, press the function key ‘F7’. After your computer has restarted you should then run the Tango installation exe.

Step 3) Once successfully installed you should see the Tango unit's main screen as shown:



The Basics

As labelled above:

1. This is the auto-detect read function on Tango. If you are unsure which type of transponder you have then this should be your starting point.

2. Under 'transponder type' there is a comprehensive drop down box which allows you to manually select the transponder you wish to read. The below image demonstrates all the transponder pages available on an ID48 Megamos transponder.

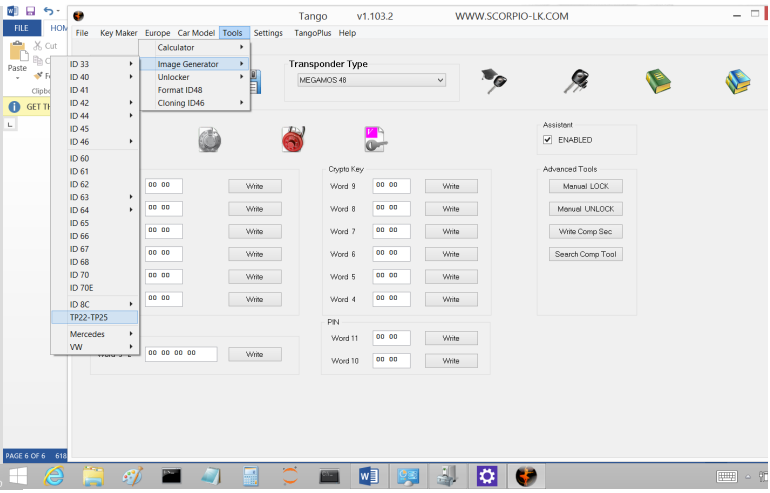
3. The 'read' page will find all the available pages on the transponder.

NOTE: crypto key pages and/or password pages are write only; therefore you will never see a display of HEX values.

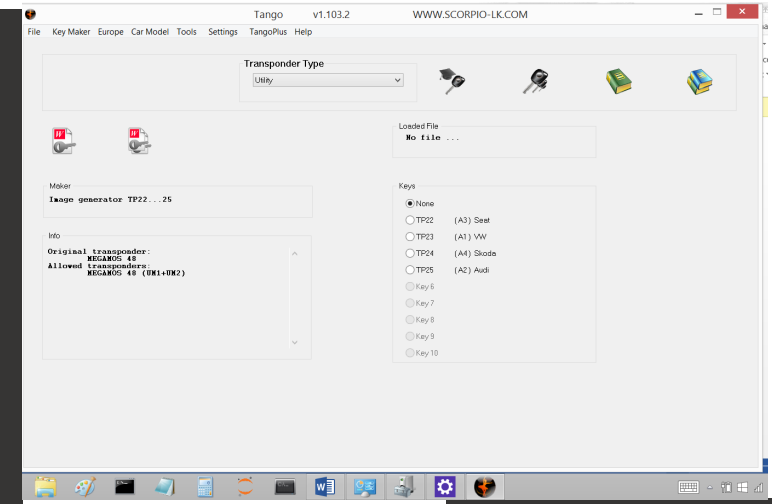
4. This icon is called the 'clone machine', and will allow standalone cloning of ALL ID4D transponders (prior to the 80bit versions). You can also clone ID46, however you need to purchase and attach the JMA TPH cloner to your Tango unit for this operation.



MONEY SAVING TIP: By using Tango, you can make standard Megamos ID48 transponders (circa £3.00) into ANY type of VAG Canbus transponder (circa £6.00) using the special Tango function.



Example: Select 'tools' – 'image generator' - 'TP22-25'



This screen will then open.

Depending on the car you wish to program you can select from the menu on the right hand-side (TP22 is SEAT, TP23 is VW etc.) your chosen vehicle and create your own canbus transponder.

The transponder will then be ready to be diagnostically programmed into the vehicle.



Now you are successfully up and running and can read, create and clone a range of transponders!

In Part 2 we will be showing you how to use the 'key maker' side of the Tango software and more importantly, how you can make money from 'hard to program vehicles' such as Toyotas, Fiat 500 (Ford KA), and many more...

Unlocked: The NEW ABS Opening Tool

(Not manufactured by ABS)

Tradelocks introduce the semi-destructive opening tool which specifically tackles the ABS 3* cylinder. Although the tool does snap some of the pins inside the cylinder, if used correctly, the original key should still work once the cylinder has been defeated – leaving almost no trace of entry.

No prior knowledge of locks is required to use the tool and it can be mastered by even beginners in a matter of minutes. The method of opening the lock is based partly on impressioning pins and partly on the destruction of resistant pins.



How to use the ABS Opening Tool

(Not manufactured by ABS)

1) Find the magnetic pin:

The ABS lock uses a dimple style keyway which has 5 pin chambers lined in a row - the pins have a 'pin in pin' arrangement. The height of the keyway is around 2.5mm, and the gap at the top right of the pin is in excess of 5mm, making quite a large hole to insert picks and other tools.

Of the 5 pin stacks, one of them has a magnetic pin which lifts upwards when the key, with the correct magnet position is inserted. To use the tool, the position of the magnetic pin must be located in the cylinder. This can be done either by eye or by using a simple diamond pick, or hook. It involves pushing each pin out of the way one at a time until the correct position is found.

Once the magnetic pin has been located, the key can be made up.



2) Create the key by choosing the corresponding blade and foam pieces:

Next, the correct blade must be chosen; there are 5 in total, 1 for each magnetic pin position. The relevant foam piece for the blade must also be chosen and there are different sizes depending where the pins will be sitting. The pieces must be placed into the blade profile using the included tweezers, to allow it to lift the pins.

3) Insert the blade (with foam pieces in place) into the lock:

The blade replicates the key; so when you insert it into the lock, the magnet will rise up. The remaining 4 pin stacks will settle into the foam and some will open. Once the blade has been inserted into the lock, the ABS Tool (not manufactured by ABS) can now be used by being slotted onto the blade and tightened.

4) Slot the T Torsion Bar onto the blade and apply pressure to the cylinder:

Use the opening tool to weaken the pins by slowly applying pressure to each side of the T Torsion Bar, slowly rocking it from side to side until the lock opens. Once unlocked, the original key should still work in the cylinder!

This tool is not manufactured by the makers of the ABS Cylinder or any company associated with the ABS Cylinder.

A Guide: Site Reading

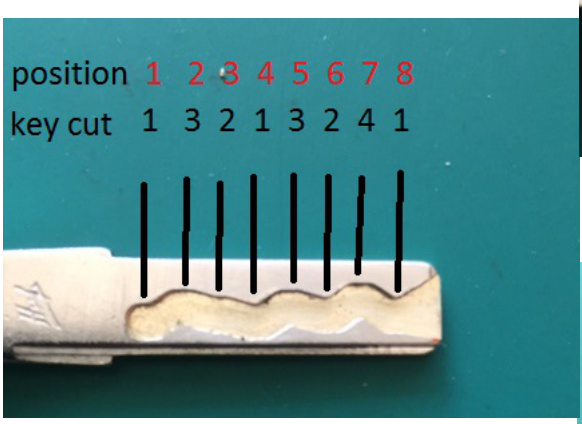
VAG Laser Key

by Martin Pink

The HU66 Standard 8 Cut Key

A very common key for the locksmith as it's fitted to almost the entire range of VAG vehicles, from 1998 models right through to 2014. There are 3 generations of this lock but the site reading remains the same for each.

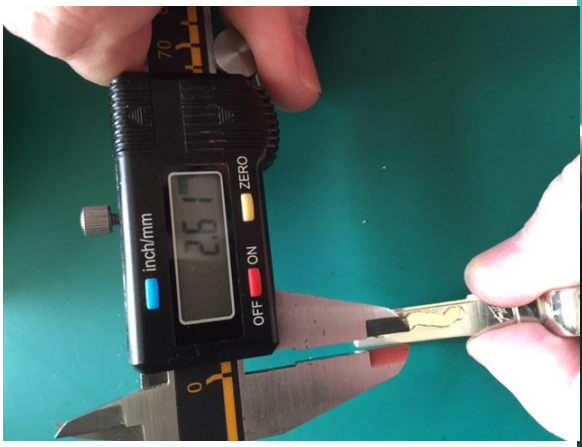
The HU66, 8 cut lock has 4 key heights and 8 key positions. The Genuine Lishi 3 in 1 tool picks and decodes the lock, as a key, from bow to tip as: 13213241.



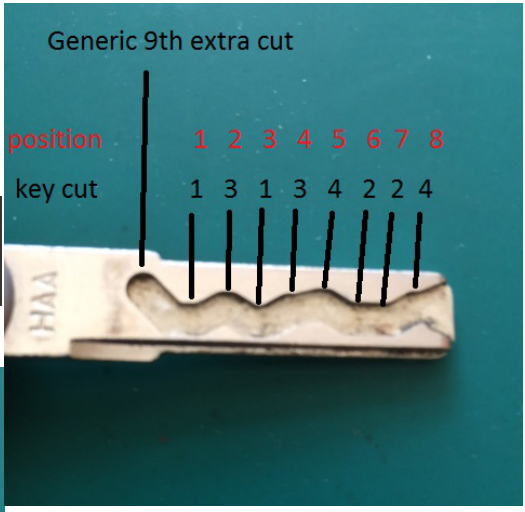
You always read the same side of the HU66 key - the top track if the bow is to the left and the tip to the right. The cuts are easily read as all 4 heights are easily identifiable. But, if you are unsure, you can use Callipers/Vernier's to measure the heights using the below table:

1 cut = 380
2 cut = 320
3 cut = 260
4 cut = 200

Use vernier's to measure the cut as shown:



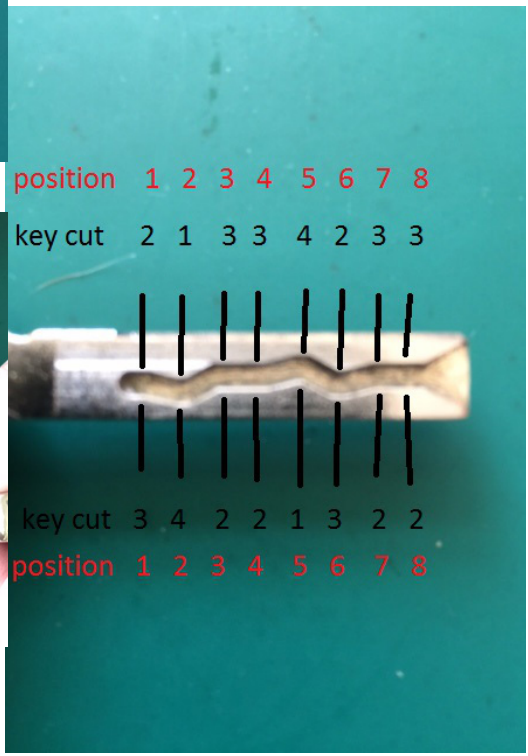
This is a very straight forward key to read and decode by eye.



The HU66, 9 Cut Key
(Generic Additional Cut)

The Kessy System is used for models fitted with the generic first cut on a 9 cut key. This 9th cut is only used in the ignition lock and is not used in the door lock, so Lishi will still pick and decode the door lock as normal. Enter the cuts into your cut to code machine selecting the correct key series and the machine will automatically cut the generic extra cut for you, in the correct position.

The generic extra cut is always the first cut nearest the bow of the key. Lishi picked the door lock and gave a reading, from bow to tip of: 13134224.



VAG 2015, 8 Cut Key: The New HU162 Profile

The new key profile throws up some new challenges; with no key rules and no key information having yet been released, it's very difficult to be 100% accurate with details given on this key.

Based on what information we have managed to gather, it seems that VAG have now gone for the use of inverted wafers similar to the PSA and Renault VA2/VA6 keyway used on the Clio 3 models.

If there are inverted wafers in such a narrow keyway there may be decode issues, as ideally you would want a 4 lift tool - but 4 lifters won't work smoothly in such a narrow keyway!

We do not know if the inverted wafers are in fixed positions or if they are random like with the VA2/VA6. If they are in fixed positions they are easily dealt with, but if random it's much harder.

The Lishi Tool decodes the key in the same direction as it was picked, so from bow to tip as: 24321223.

We can see that because of the inverted wafers, the Lishi tool is reading the positions differently. The lock is a 2 up, 2 down configuration; so, when reading the key the same way as it was picked, each position is being read as follows:

Positions I and 2 down on the bottom track - positions 3 and 4 on top track - positions 5 and 6 on the bottom track - positions 7 and 8 on the top track.

It read as 24321223; so, it has read positions 2, 3, 5 and 8 correct, but has read the opposite cut in positions 1, 4, 6 and 7. This suggests positions 1, 4, 6 and 7 are inverted wafers.

If this is to be fixed in all locks then all we would need to do is reverse the cuts in these positions. So, instead of a decode of 24321223, we would reverse cuts in positions 1, 4, 6 and 7 which would leave us with a decode of 34331333.

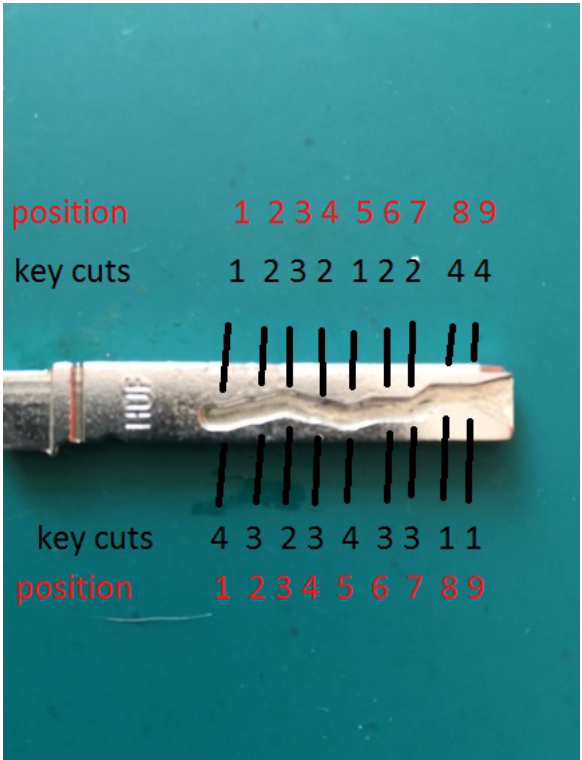
NOTE: It is an impossible key to give an accurate decode and site read on until the key rules and series information is available

VAG 2015, 9 Cut Key:
The New HU162 Profile

And it's all changed again with the 9 cut lock, which uses 3 side cuts in position 1 to 3, with corresponding conventional cuts.

NOTE: The door lock uses side cuts in these positions but the ignition does not use side cuts and instead uses the 9 conventional cuts.

Site reading the conventional cuts is simple; the lock has 9 cuts, 3 side cuts and 6 conventional cuts in the door and 9 conventional cuts in the ignition, with the conventional cuts being simple enough to site read.



Like the 8 cut lock, each cut on the top track has its opposite cut across it on the bottom track; the 2 cuts when added together will always equal 5.

The cuts follow a 2 up, 2 down pattern; so, the Lishi tool reads the cut in same direction as picked:

Cuts 1 and 2 on the top track - cuts 3 and 4 on the bottom track - cuts 5 and 6 on the top track - cuts 7 and 8 on the bottom track - cut 9 on the top track.

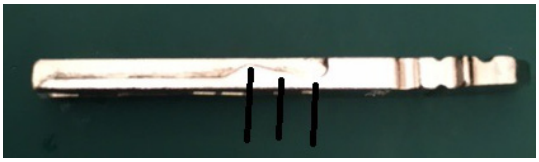
However the door lock has 6 conventional cuts just in positions 4 to 9, which read as: position 4 on the bottom track - position 5 and 6 on the top track - 7 and 8 on the bottom track - position 9 on the top track. This lock doesn't seem to use inverted wafers; therefore the Lishi tool reads it straight off in positions 4 to 9 as: 312341.

Site reading is also a simple task as the 4 heights are easily defined on both sides of the cut, and each cut has its corresponding cut sat directly opposite it:

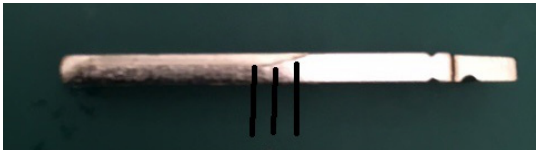
4 cut will always sit opposite a 1 cut
3 cut will always sit opposite a 2 cut
2 cut will always sit opposite a 3 cut
1 cut will always sit opposite a 4 cut

The 2 opposing cuts will always add up to 5.

Again as no key information has been released, we can only guess at this stage on how the code will be entered into the machines for cutting.



Side cut 2 3 4



3 2 1

Notice how the side cuts match the conventional cuts.

Side one of side cuts 4, 3 and 2 matches the bottom profile's first 3 cuts of 432. Side 2 of side cuts 1, 2, and 3 matches the top profile 1 and 3 cuts of 123.

In our picture above of the conventional cuts, the top track has cuts 123 in the first 3 positions, the side cuts on the side above this will be 432 - direct opposites.

The conventional cuts on the bottom track of 432 have cuts on the side profile below it of 123 - direct opposites.

So if site reading the key with the bow to the left and the tip to the right, you get:

Top profile: 123212244
Bottom profile: 432343311
Side cuts in the first 3 positions above the top profile will be 432, and side cuts in the first 3 positions below the bottom profile will be 123.

Again, side profile relationship to conventional track cut will add up to 5, so a bottom track cut of 4 will have a corresponding side cut of 1 and vice versa.

When reading a key's conventional cuts, you can work out the correct side cut on each track simply in the first 3 positions.

NOTE: Remember this is speculation as no key series or rules have yet been released

VAG 2015, 10 Cut Key:
The New HU162 Profile

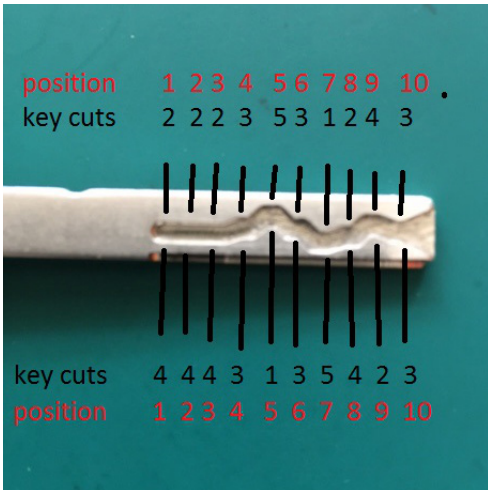
Here, the principle remains the same as with the 9 cut key but instead has 10 cuts in total. In the door the first 4 cuts are side cuts with the last 6 cuts being conventional – although the key still houses all 10 conventional cuts. A difference between this lock and the 9 cut is that the side cuts are an opposite profile to the 9 cut key and this lock uses 5 key heights instead of 4.

This lock has 4 side cuts in the door lock, 2 on one profile and 2 on the opposite; then 6 conventional cuts. The key also houses a full conventional 10 cuts – should they decide to use an ignition. But, so far this lock has only been seen on models using slot keys and not on models using a normal ignition.

It uses 5 key heights on the conventional cuts, but looks like just 4 cut heights on the profile sides in the first 4 positions.

Site reading this key is very similar to site reading the 9 cut key, the only difference is that you have 1 extra cut - a side cut.

Here is the key and its cut heights in the conventional cut positions:



This one is a nice and easy key to site read!

The key contains all possible cut heights on each track, so it is a simple process.

Like the 9 cut lock, a cut on the top track has its corresponding cut opposite to it on the bottom track, so the 2 cuts added together equal 6 - if they don't add up to 6 then the site read is incorrect.

The conventional cuts in positions 1 to 4 only use heights 2, 3 and 4 - cut heights 1 and 5 are not used in these first 4 positions as they will need to correspond to the 4 cut heights on the side profiles. Positions 1 to 4 conventional cuts will always be 2, 3 and 4.

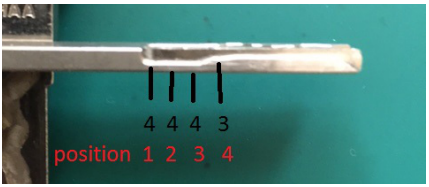
The site read on the conventional cuts reads as:

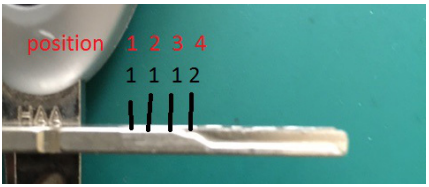
Top track from bow to tip: 2223531243
Bottom track bow to tip: 4443135423

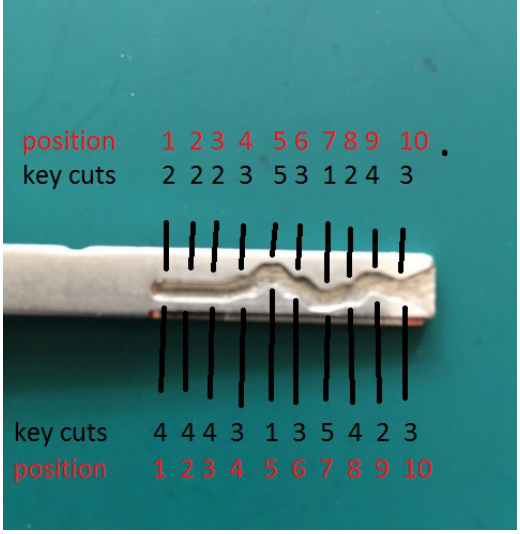
The Genuine Lishi tool when decoding this reads a key from bow to tip; positions 5 to 10 and equals: 531423.
So this tells us the key reads and interacts with wafers in the following way, the cuts in red are the ones the key is reading:

Top track – 2223531243
Bottom track - 4443135423

Look at the side cuts on the 10 cut key in the below 2 images:







This is where some find site reading this key awkward. The conventional cuts in these first 4 positions use 5 heights but the side profile uses just 4 heights. The cuts on the side profile must add up to 5; the cut in position 1 on the first side profile is a 4 cut, therefore the cut in the first position on the opposing profile must be a cut 1 – equalling 5.

To be able to work out the side cut site read, we need to know which side profile cuts are the ones that interact with the key. So let's look again at the images:

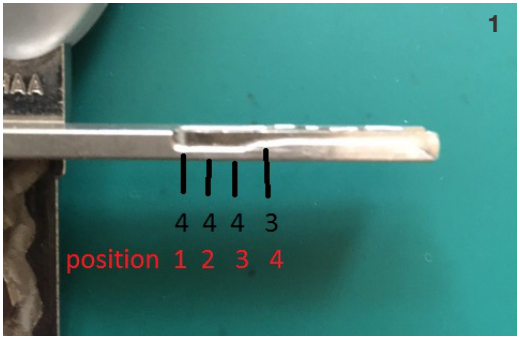


Image 1 is of the side profile above the top track which interacts with the key in positions 1 and 2.

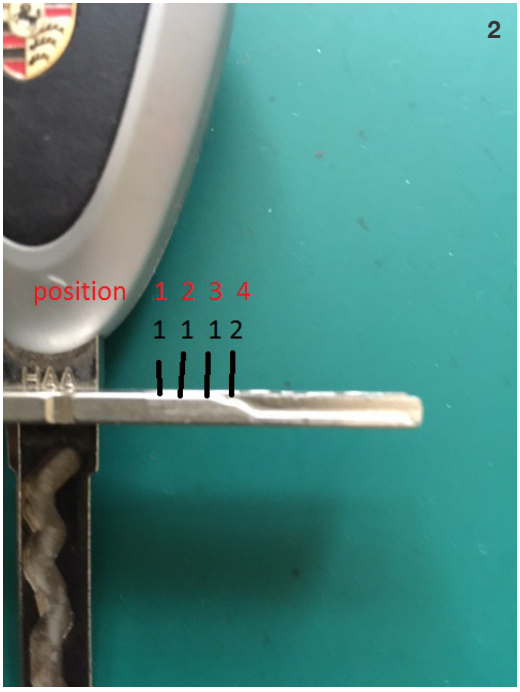


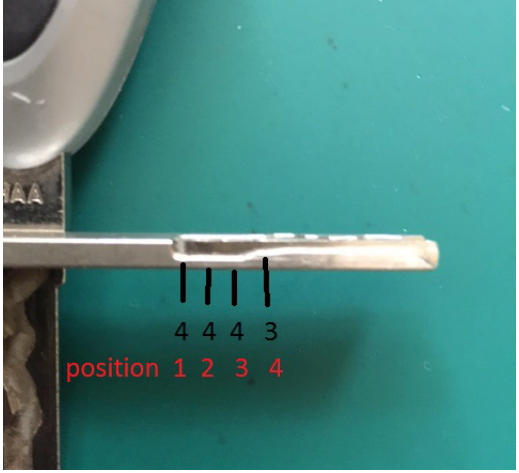
Image 2 is the side profile below the bottom track which interacts with the key in positions 3 and 4.

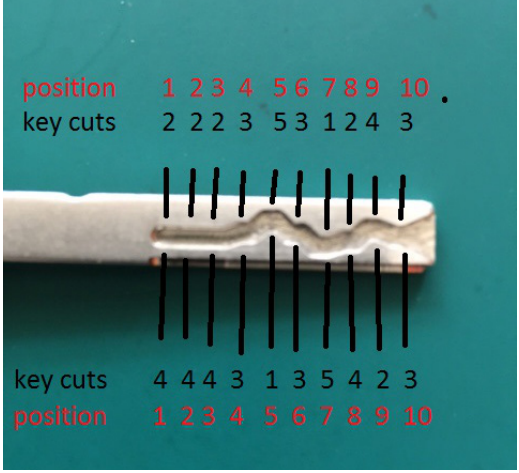
From image 1 we know the side cuts that we need to site read are in positions 1 and 2 only, so are cuts 44. Therefore the cuts on the opposite side profile have to be 11 in positions 1 and 2.

In image 2 we know the side cuts we need to site read are in positions 3 and 4 only, and are cuts 12. So, the cuts on the opposite side profile have to be 43 in positions 3 and 4.

This then gives us side cut readings in image 1 of 4443, and in image 2 of 1112.

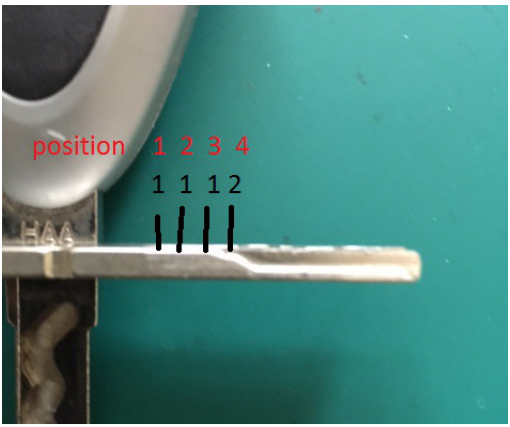
To understand how we convert these side cuts to the correct conventional cuts we look at these images:

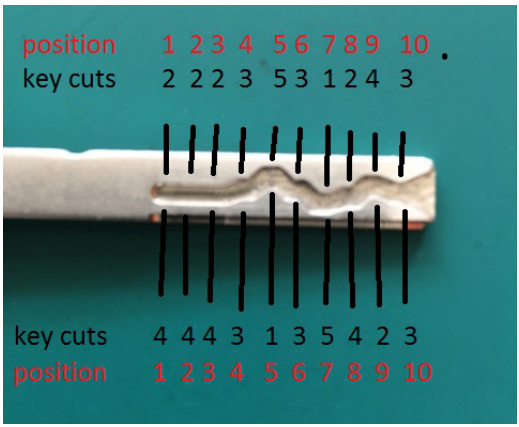




So above is an image of the side cuts that sit above the top track; for this side profile we are only interested in position 1 and 2, these are both 4 cuts so relate to number 2 conventional cuts.

Below is an image of the side cuts that sit below the bottom track, for this side profile we are only interested positions 3 and 4, these are 1 and 2 cuts so relate to conventional cuts in position 3 and 4 of 4 and 3.

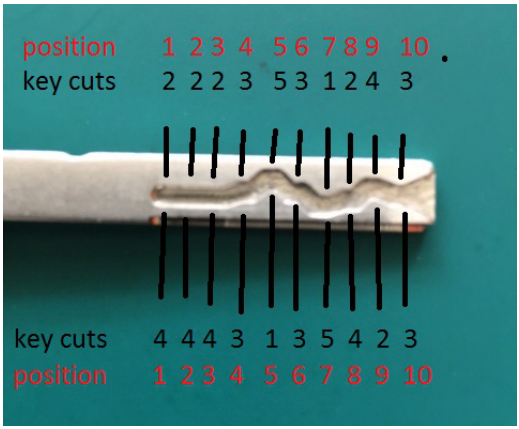




We can site read the side cuts to find their corresponding conventional cut, but this can be a complicated way of doing it in relation to site reading, it will be easier to convert the conventional cuts to the correct side cuts, take our key below:

The conventional cuts in position 1 and 2 on the top track are 22 so become side cuts above the top track in position 1 and 2 of 44. The conventional cuts in position 3 and 4 on bottom track are 43, so become side cuts below the bottom track in position 3 and 4 of 12.

I suspect that key machines once they have the capability to cut these will convert the correct side cuts from the conventional cuts entered manually and vice versa.



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GK100 & GKM: Glass Chip Transponder Technology from Keyline

By Massimo Bianchi – Keyline Strategic Planner



It was back in 2003 when we first had to deal with the Texas Crypto 1 transponder, and when we first realised that the antenna appointed to a 'chip' was simply not powerful enough to satisfy its communication requirements. To solve this problem, we opted for the 'electronic head,' with a much more powerful antenna.

This is how we started our first TK series (TK24, TK30, TK40, and TK60), which in turn led us to the very first universal transponder, assembled in the TK100 head.

The final versions of Keyline heads were achieved in November 2015 - with the launch of the TKM head. The worldwide, unique, electronic head able to clone the transponder Megamos Crypto (ID48) - applied in over 200 car models.

Today, our proven experience with transponder cloning technology has led to other accomplishments and further developments in automotive products. Of course, I am talking about the glass transponders GK100 and GKM.

How they are made:

They differ from other transponder solutions due to their external glass case and their compact dimensions: 0.9 inches in length for the GK100 and 0.5 inches for the GKM.

Another characteristic that makes these products unique is that there is no need for additional tools like batteries for them to function. Just like the electronic heads, the glass chips are charged from the electromagnetic field, generated by the antenna in the ignition lock. Meaning we can be confident when saying that these products have an unlimited operation life.



How they work

Fundamentally, they work in the same way as an electronic head. But, the sniffing function is integrated into the glass chip (so there is no need for 'snoop' like with Silca products), and the glass chips can recover the data from the immobiliser box, with a sequence of attempted ignitions - a function that is normally performed to start the engine. This is done three times to clone the Philips Crypto (ID46) and eight times for the Megamos Crypto (ID48). That function is not required by transponder Texas, fixed and crypto codes, because exclusively the cloning tool does the entire calculation procedure.

Another very important aspect of this technology is that the glass chip is rewritable, and this can be done a limitless amount of times, without affecting the functionality of the cloning.

Cloning capability

With GK100, the user can clone the transponder Philips Crypto (ID46) and Texas; fixed and crypto (ID4D and ID4C).

The GKM can exclusively clone the transponder Megamos Crypto (ID48) and fixed code (ID13).

GK100 and GKM together guarantee a wide range of vehicle coverage, with a circulation that equals 95% of cars, motorcycles and trucks - with a success rate of 99.5%.

Conditions of Use

GK100 and GKM work perfectly on 884 Decryptor Ultegra and 884 Decryptor Mini, and thanks to Keyline software, they can be used in parallel with the TK electronic heads.

Applications

Due to their small size, GK100 and GKM perfectly adapt to the products that are dedicated to cloning functions, such as Pod keys, Shell Keys and Flip keys. They can be accommodated to each specific chip holder, which has been designed to support the communication between the antenna in the ignition lock and the transponder in the key.

GKM and GK100 Glass Chips will be available at Tradelocks this April & May!

How to Recognise Bumping: A Basic Guide

It has often been said that bumping is difficult to detect without the use of special equipment.

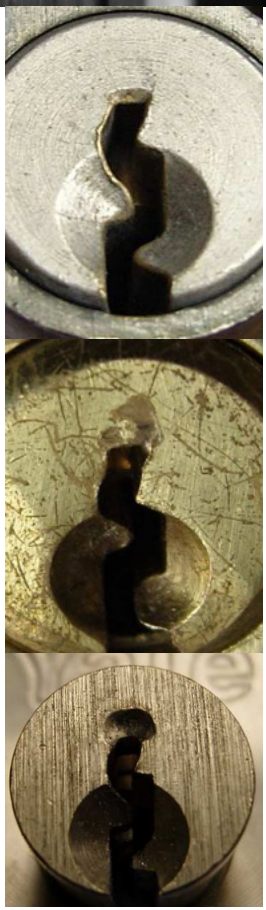
By Chris Belcher

With the help of this guide, locksmiths who have to deal with these situations should be able to determine with reasonable accuracy, if indeed a cylinder has been damaged due to bumping, using just the naked eye, and a few common tools.

There have been over the years, misconceptions of how the mechanics of bumping works. This article shows how just one part of the process causes enough damage to allow accurate identification of bumping.

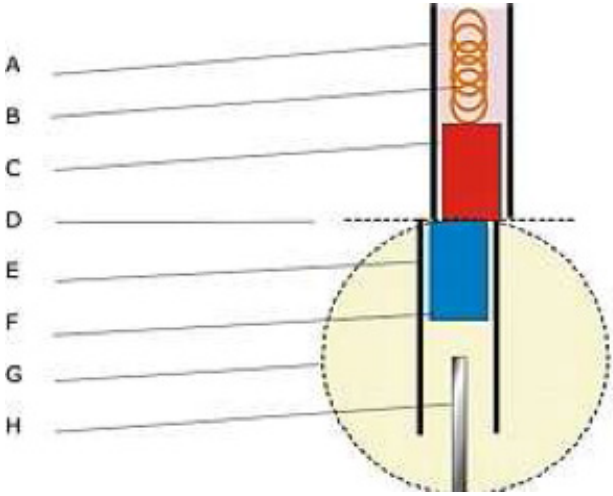
Keyway Damage

A few forms of bumping cause damage to the front face of the cylinder core as shown in the photos, chrome plated cylinders are more resistant to this damage than brass, because chrome plating gives a hard protection to the metal underneath.



The other forms of bumping, which incorporate a spring or spacer to dampen the strike or return the bump key to its start position, may leave little or no marking on the front face of the cylinder core. Because of this, in all cases of suspected illegal non- destructive entry, marked or not, an inspection should be carried out. Also, use of the correct key, over a period of time will have similar effects as seen on the lighter marked cylinders in the photos.





Basic Diagram of Pin Cylinder

To fully understand what causes the internal damage to a cylinder when a bump strike is made, you need to understand what causes the damage. To do that you need to know part of the mechanics of bumping.

This diagram shows the top and bottom pins at the shear line during the bumping process:

Index:
A) Driver or Top Pin Chamber, B) Spring, C) Driver or Top Pin, D) Shearline, E) Plug or Bottom Pin, G) Cylinder Plug, H) Key Way

Bumping Action Mechanics

When tension is applied to the cylinder core, it rotates fractionally, trapping the driver/ top pin at the shear line. At this point it is in contact with the plug/ bottom pin.

The top and bottom chambers are misaligned at the shear line. When the bottom pin is struck it moves upwards taking with it the top pin until it reaches the shear line (they do not separate before this).

The bottom pin then strikes the rim of the upper chamber at its entrance because of the misalignment, so causing distinctive marks at the entrance to the driver/ top pin chamber.

The lower pin quite often stops at this point and sometimes will carry on moving upwards.

In some cases the lower pin can completely enter the upper chamber damaging the spring. As the lower pin passes the shear line the damage to the upper pin chamber causes scratching to the body of the lower pin. (See photographs)

By putting all this information together, it becomes relatively easy to determine if a cylinder has been bumped.

NOTE: These tests were carried out on a variety of cylinders including: rim cylinders, where the plugs are at the bottom and cylinders such as euro-profile cylinders whose plugs are at the top.

Chamber Damage

In all cases of bumping, damage is caused to the internal components of a cylinder.

Below are examples of damage caused to the entrance area of the upper/drive pin chambers:

In photograph 1 the pins have been struck in different positions around the entry to upper/ driver pin chambers. This was caused by excessive end-float of the core and reversing the direction of the tension on the core. This cylinder took several bumps to open and would be normally classed as 'difficult to bump' although not 'bump resistant'.
The 4th chamber down shows some distortion at the 6 o'clock position.

In photograph 2, the 3rd chamber down shows heavy marking around the lip of the chamber, and at 11 o'clock some considerably heavy marking and slightly lesser markings on chamber number 4 at the same position.

In photograph 3, a single bump strike not intending to open the cylinder, but just to see what the marks would be on a chromed cylinder upper chamber, you will see slight oval distortion on the 3rd chamber down, with the 5th chamber showing the shiny strike mark at the 11 o'clock position.

These photographs are looking at the surface damage of the cylinder housing.

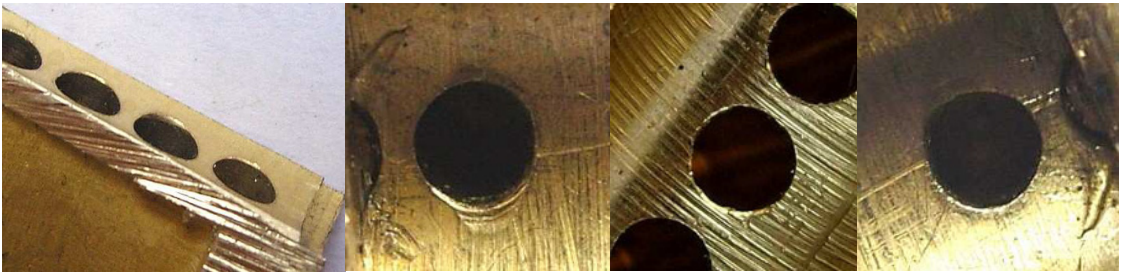


1

2

3

Below are further photographs giving different views of the same damage, looking at different angles:



Spring Damage

Now we come to the damage to the springs.

Below is a photograph of three springs; the left hand spring in the 1st photograph is an undamaged spring from a bumped cylinder.

The centre spring is a damaged spring from the same cylinder. This is due to the length of the bottom and top pins and the strength of the bump strike.

The photograph on the right shows yet another damaged spring from a bumped cylinder. Therefore it should be part of the inspection to see that all of the springs are still relatively uniform.



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N	Z	I	F	L	O	G	N	A	T	W	T	E	G	G	N	T	P	B	R
E	L	E	Z	N	Y	E	R	H	X	I	S	N	V	V	A	B	J	Q	E
E	O	T	R	A	N	S	P	O	N	D	E	R	W	B	L	I	E	O	C
I	R	U	U	T	O	R	S	M	S	A	W	Y	W	O	I	C	L	B	V
L	F	N	S	S	S	Y	V	N	L	O	I	U	Y	R	Y	Q	Q	Y	N
D	L	Y	Z	C	Z	C	A	G	A	V	R	E	P	U	S	R	A	C	D

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